3A NODE1/PMA1 SHELL WARM-UP

1. DOCUMENT HEATER POWER ALLOCATION FOR WARM UP

NOTE
The heater power allocation recorded in this step is the total power available to the US segment minus the current housekeeping power.

√**MCC** for heater power allocation

Record heater power allocation: _____ W

2. VERIFY PMA 1 AND NODE 1 HEATERS INHIBITED

NODE1: TCS

√PMA1 HtrA,B Availblty (eight) - Inh
√Nod1 HtrA,B Availblty (eighteen) - Inh

3. NODE 1/PMA 1 SHELL HEATER PRIORITIZATION

NOTE

1. Node 1 and PMA 1 heaters are reconfigured at four hour intervals based on Shell Temperature and heater power allocation. The coldest areas of the PMA 1 or Node 1 shell will be given the highest priority when heaters are enabled. Heater availability will be commanded to "Enabled to Operate" in priority order, starting with the PMA 1 or Node 1 heater control zone with the coldest temperature.

2. Rank Node 1 and PMA 1 Shell Heaters from coldest to warmest using the temperature sensor(s) associated with each heater.

3. Record the heater priority in Table TBD1.

4. In the priority order documented in Table TBD1, select a group of heaters that can be commanded to the "Enabled to Operate" state within the heater power allocation recorded in Step 1.

5. If a given heater will cause the total heater power to exceed the power allocation documented in Step 1 then that heater should be skipped and the next heater in priority order should be compared to the power allocation. All PMA 1 and Node 1 Shell Heaters should be evaluated in priority order.

Document in Table TBD2 the group of heaters to be enabled.

4. INHIBIT PMA 1 AND NODE 1 HEATERS NOT SELECTED FOR WARMUP

NOTE
This step inhibits Node 1 and PMA 1 Shell Heaters which were used in the previous four hours of the warm up but were not selected for the next four hour warm up period. When Step 4 is executed for the first time, all heaters will already be Inhibited.

If any PMA 1 (Node 1) Htr[X]A(B) not included in Table TBD2 is Ena Opr

sel PMA1 Htr (Node1 Htr 1 --- 6) (Node 1 Htr 7 --- 9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel PMA 1 (Node 1) Htr[X]A(B)

cmd PMA 1 (Node 1) Htr[X]A(B) - Inhibit
√PMA 1 (Nod1) Htr[X]A(B) Availability - Inh

Repeat

5. ENABLE PMA 1 AND NODE 1 HEATERS SELECTED FOR WARMUP

NOTE
This step Enables Node 1 and PMA 1 Shell Heaters which were not used in the previous four hours of the warm up but will be used in the next four hour warm up period. When Step 5 is executed for the first time, all heaters will already be Inhibited.

If any PMA 1 (Node 1) Htr[X]A(B) included in Table TBD2 is Inh

sel PMA 1 Htr (Node 1 Htr 1 --- 6) (Node 1 Htr 7 --- 9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel PMA 1 (Node 1) Htr[X]A(B)

cmd PMA 1 (Node 1) Htr[X]A(B) - Ena Operate
√PMA 1 (Nod1) Htr[X]A(B) Availability - Ena Opr

Repeat

Wait 4 hours and repeat steps 2 --- 5 until all Node 1 and PMA 1 shell temperatures are ≥ 18° C.

6. INHIBIT A HEATERS AND ENABLE TO OPERATE B HEATERS FOR NODE 1/PMA 1 SHELL TEMPERATURE MAINTENANCE

NOTE
Step 6 should be executed only after all PMA 1 and Node 1 shell temperatures are ≥ 18° C.

If any PMA 1 (Node 1) Htr[X]A not Inh

sel PMA 1 Htr (Node 1 Htr 1 --- 6) (Node 1 Htr 7 --- 9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel PMA 1 (Node 1) Htr[X]A(B)

cmd PMA 1 (Node 1) Htr[X]A(B) - Inhibit
√PMA 1 (Nod1) Htr[X]A(B) Availability - Inh

Repeat

If any PMA 1 (Node 1) Htr[X]A not Ena Opr

sel PMA 1 Htr (Node 1 Htr 1 --- 6) (Node 1 Htr 7 --- 9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel PMA 1 (Node 1) Htr[X]A(B)

cmd PMA 1 (Node 1) Htr[X]A(B) - Ena Operate
√PMA 1 (Node 1) Htr[X]A(B) Availability - Ena Opr

Repeat

NOTE
The final configuration for PMA 1 and Node 1 Heaters is provided in Table 3. The setpoints and failure limits for each temperature sensor are not changed in this procedure and are provided in Table 3 for reference only.

TABLE 3 - PMA 1/NODE 1 HEATER CONFIGURATION TABLE
NODE 1/PMA 1 WARM UP

PMA 1 HEATERS (ALL TEMPS IN °C)

HEATER	AVAIL-ABILITY	UPPER SETPOINT	FAILURE UPPER LIMIT	LOWER SETPOINT	FAILURE LOWER LIMIT	CYCLIC LOAD DELTA
1A	Inh	21	45	18	-18	0
1B	Ena Opr	21	45	18	-18	0
2B	Ena Opr	21	45	18	-18	0
3A	Inh	21	45	18	-18	0
3B	Ena Opr	21	45	18	-18	0
4A	Inh	21	45	18	-18	0
5A	Inh	21	45	18	-18	0
5B	Ena Opr	21	45	18	-18	0

NODE 1 HEATERS (ALL TEMPS IN °C)

HEATER (SENSOR)	AVAIL-ABILITY	UPPER SETPOINT	FAILURE UPPER LIMIT	LOWER SETPOINT	FAILURE LOWER LIMIT	CYCLIC LOAD DELTA
1A (Snsr 1)	Inh	21	45	18	-18	0
1A (Snsr 2)		21	45	18	-18	0
1B (Snsr 1)	Ena Opr	21	45	18	-18	0
1B (Snsr 2)		21	45	18	-18	0
2A	Inh	21	45	18	-18	0
2B	Ena Opr	21	45	18	-18	0
3A (Snsr 1)	Inh	21	45	18	-18	0
3A (Snsr 2)		21	45	18	-18	0
3B (Snsr 1)	Ena Opr	21	45	18	-18	0
3B (Snsr 2)		21	45	18	-18	0
4A	Inh	21	45	18	-18	0
4B	Ena Opr	21	45	18	-18	0
5A (Snsr 1)	Inh	21	45	18	-18	0
5A (Snsr 2)		21	45	18	-18	0
5B (Snsr 1)	Ena Opr	21	45	18	-18	0
5B (Snsr 2)		21	45	18	-18	0
6A (Snsr 1)	Inh	21	45	18	-18	0
6A (Snsr 2)		21	45	18	-18	0
6B (Snsr 1)	Ena Opr	21	45	18	-18	0
6B (Snsr 2)		21	45	18	-18	0
7A(Snsr 1)	Inh	21	45	18	-18	0
7A (Snsr 2)		21	45	18	-18	0
7B (Snsr 1)	Ena Opr	21	45	18	-18	0
7B (Snsr 2)		21	45	18	-18	0
8A	Inh	21	45	18	-18	0
8B	Ena Opr	21	45	18	-18	0
9A	Inh	21	45	18	-18	0
9B	Inh	21	45	18	-18	0

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